

Transition of Research Applications to Climate Services (TRACS)
(formerly NOAA Climate Transition Program (NCTP))
FY2007 Program Information Sheet
May 2006

Introduction

Application of the best available science and technology is essential to meeting NOAA's mission. This demands an operations enterprise able to apply new research in a timely manner, a research enterprise focused on understanding and applying emerging science and technology to user needs, and effective and efficient processes and procedures to ensure the timely transfer of research to operational status or information services in meeting mission responsibilities.¹

NOAA's Climate Program Office has recently established a Regional Decision Support (RDS) Program to accelerate interaction with users of climate information and forecasts at multiple spatial and geographical scales. The RDS portfolio helps NOAA identify and serve the nation's needs for climate information to support decision making through an integrated program of: 1) research and assessment related to impacts and decision making needs; 2) transition of research to operations and information services; and 3) operational production and delivery of local and regional climate services that can be utilized to enhance adaptive management options. NOAA's RDS activities include efforts managed by the research and operational entities of the agency, and involve productive partnerships with other agencies, universities, data centers, and stakeholders. The Climate Assessments and Services Division (CASD) within the Climate Program Office houses the RDS Program's research and transition capabilities (see above #1 & #2) including, the competitive, grants-based Sectoral Applications Research Program (SARP), Regional Integrated Sciences and Assessments (RISA) Program, and Transition of Research Applications to Climate Services (TRACS) Program.²

¹**NOAA Administrative Order (NAO) 216-105: POLICY ON TRANSITION OF RESEARCH TO APPLICATION** <http://www.corporateservices.noaa.gov/~ames/NAOs/Chap_216/naos_216_105.html>:

^{1,2}**Definitions:**

Transition: The act of passing from one state, place, or stage to another; the act of handing over something to another person (The American Heritage® Dictionary of the English Language, Fourth Edition copyright ©2000)

Research: Systematic study directed toward fuller scientific knowledge or understanding of the subject studied.

Application(s): Information Services and Operations

Information Services: Timely production and delivery of interpreted and/or synthesized data, decision tools, and scientific knowledge and understanding to decision and policy makers, scientific community, and the public.

Operations: Sustained, systematic, reliable, and robust mission activities, with an institutional commitment to deliver appropriate, cost-effective products and services.

Climate Services: The timely production and delivery of useful climate data, information, and knowledge to decision makers ("A Climate Services Vision: First Steps Toward the Future" (2001), Board on Atmospheric Sciences and Climate (BASC), National Research Council)

The TRACS Program mission is to transition experimentally mature climate tools, methods, and processes from research mode into settings where they may be applied in an operational and sustained manner, generating continuous delivery of useful climate information products and services to local, regional, national, and international decision and policy makers. TRACS seeks not only to support implementation of these transitions, but also to learn from doing how better to accomplish technology transition processes for public goods applications and improved risk management.

Given the NOAA Transition Policy and definitions in the footnotes, the change in name from NCTP to TRACS is significant. The title TRACS, besides evoking a focus of being “on-track”, should also call attention to three key elements and their interplay. These activities include, transitions (i.e. a focus on partnerships where hand-offs occur), research applications (i.e. experimentally developed and tested, end-user-friendly information to support decision making), and climate services (i.e. the routine and timely delivery of that information, including via partnerships).

What TRACS is not?

TRACS is not an operational or services activity by itself, but by design functions as a bridge to effect transitions through partnerships with operational entities. TRACS does not support major “upstream” research and development (R&D) for observing, modeling, or forecast systems, including the funding of “test-beds”. TRACS is not intended to be a means to actually develop “from scratch” end-to-end research applications, to support initial contact with operational or user partners, or to explore more broadly the development of climate services (these activities are supported more generally by the RDS SARP and RISA Programs, along with the rest of the Climate Program Office portfolio).

What TRACS is?

TRACS is about transition partnerships for climate time-scale products and services. TRACS is a research program, with transition projects motivated by researchers (rather than operations managers). However, because it is experimental in nature project success is not necessarily guaranteed. TRACS is designed to compliment on-going research partnerships and interactive learning among researchers, operational entities, extension agents, and end-users developed under the RDS SARP and RISA Programs—or in other similar ventures involving NOAA and its stakeholder communities. TRACS should build bridges between RDS research and operations capabilities and partners. TRACS proposals should focus on developing means of communication and feedback, and on deep engagement with the operational and end-user communities over a finite period, but should also help establish relationships and trust that will endure. TRACS is intended to transition research applications that have been tested in practice “downstream” of major research activities, have the potential to be reliably applied, and are on the cusp of being ready to “hand-off” for regular and sustained delivery and/or use. TRACS may indeed help facilitate transition into applications of products and services developed in “test-beds”. TRACS proposals may focus on local, regional, or national scale decision support tools and systems. TRACS focuses on climate time-scales, but welcomes work on the interaction among climate and weather research and decision-making. TRACS proposals should rigorously

identify and evaluate benefits to society of the transition project.

TRACS Elements for FY2007 Proposals:

In FY 2007, the TRACS is soliciting a limited number of new proposals only for applications related to water resources and hydrology that make use of climate-time-scale datasets or probabilistic hydrologic forecasts. The Climate Program is interested in considering proposals in which climate forecasts and outlooks longer than two weeks into seasons and years can be used to produce probabilistic hydrologic forecasts that can be applied to water resources applications, particularly related to drought. Examples of applications would be basin- to regional-scale high-resolution (~1km) soil moisture forecasts that can be applied by, for instance, irrigation managers in crop selection, water banking, and/or drought management; strategic reservoir operations planning that allows the substitution of fixed reservoir operating rules by probabilistic real-time reservoir operations of single- or multiple-purpose reservoirs or basin-scale management activities. TRACS would also like to acknowledge the partnership and support of the National Weather Service's (NWS) Office of Hydrologic Development (OHD) in this year's grants competition announcement.

The program is open to the climate and weather research communities, including the private sector, encouraging the most efficient transition of research-based decision support prototypes into applications for climate services.

NCTP is based on a "Unit Model" (Figure 1) that defines the interactions among "Unit" participants or components, representing research, operations, extension, and decision-makers (end-users) to accomplish particular transition tasks. A successful proposal means that Unit participants will have already collaborated to identify a problem and developed a prototype solution or tool with funding focused mostly to transition the product to operations or services. The Unit components must be identified and defined explicitly within the proposal. One entity may act as more than one component, but cannot act as the entire Unit as collaborations with other members of the climate community are required. The Unit is envisioned as a capsule to address and solve specific decision maker problems and to provide a suitable, clearly stated solution via the transition activity.

An example of a Unit could be a manager of a hydroelectric power plant (i.e. a decision maker) who wishes to regulate flow through a dam on a daily and week-to-week basis. A researcher at a university may have conducted research on combining upstream and downstream river flow forecasts over multiple time horizons with information on impacts on fish migration and/or reproduction/survival, downstream estuaries, storage requirements, and irrigation demands, and is ready to work with an operational entity at the plant to develop a product to determine optimum flows through the dam structure based on the researcher's model. An extension component would work with the researcher and the operational entity to ensure the real-time flow of (1) the forecasts and (2) information on current conditions and developing impacts, needed as input to the model. The latter would be provided through outreach to and education of the communities, including local farmers, fishermen, sportsmen, commercial enterprises, such

that they can provide input to the process and modify their activities to take advantage of changes in flow from the dam.

A suggested new element for FY2007 encourages operational, extension, and/or user partners to participate with researchers in preparing the proposal, most suitably the applications or operational portions. The objectives of this new element are to help reviewers to identify that the information tools are “ready for prime-time” (i.e. mature), that the transition project is doable in the time allowed, that there is strong support and involvement from non-researchers, that there is a high likelihood that there will be successful transition that will be sustained after the project ends, and to establish a clear link to societal benefits. Proposals will be rated on scientific merit (i.e. is the science advanced enough to make a difference in decision making processes, or to change decision behavior?) and applicability (i.e. have the requisite partnerships been established and the potential project benefits been demonstrated at least experimentally?)

TRACS encourages proposals that knit together researchers with climate services activities at one or more of the following organizations representing operational, extension or decision maker communities: National Weather Service (NWS) Regional Headquarters, NWS Weather Forecast Offices (WFOs), NWS River Forecast Centers (RFCs), NOAA/NWS Climate Prediction Center (CPC), Climate Test Bed (CTB), Hydro-meteorological Testbed (HMT), National Climate Data Center (NCDC), Regional Climate Centers (RCCs), the International Research Institute for Climate and Society (IRI), state climatologist’s offices (SCOs), RISA Teams, other federal, state, and local agencies, and the private sector. TRACS also encourages engagement with state or federal extension activities, organizations, or networks.

It is suggested that successful proposals should work to include the following elements, as well as address the program goals and objectives. These conditions are:

- Clearly defined climate time-scale dimension to the problem and solution/tools, even if applied to weather time-scale decision support;
- Clearly defined decision maker, research, operations and extension components of the “Unit”—including whole Unit participation in proposal preparation is highly recommended;
- Project management description including duration and timeline less than 5 years;
- Benefit analysis (rigorous valuation of socio-economic, ecosystem, or other measurable benefits), including outline of methodological approaches for evaluation;
- Address post audit evaluation (validation, verification, refinement, maintenance, etc.) to determine at the end of the project if the transition has been achieved and is sustainable;
- Formal agreement between participants (if possible) - represented as signatures on the proposal and/or more formal documents, such as, Letters of Support or Memoranda of Understanding (MOU);
- Defined researcher contributions are required in the form of 5% matching funds, personnel support, or other contributions; additionally, in-kind contributions from operations, extension, or decision-maker partners are encouraged;
- Demonstrate generally how the project supports NOAA mission goals.

TRACS (formerly NCTP) is a relatively new program that NOAA started in 2005 so no transition projects have yet been completed. Abstracts for currently funded projects are available at: <http://www.climate.noaa.gov/index.jsp?pg=../cpo_pa/cpo_pa_index.jsp&pa=nctp&sub=3>

In FY2007, NOAA intends to support the start of approximately 3-5 new transition projects with total project costs in the roughly \$50K-\$300K range over 12-36 months (and a maximum of \$500K over 60 months).

In addition, please provide a minimum of four names of potential mail reviewers that NOAA could use to review your project. If we use your suggestions, these reviewers will have to sign a document that assures that there is no conflict of interest on their part in reviewing your proposal.

Additional Hints for Successful Proposals:

- It is suggested that applications read information sheets and background for SARP and RISA Programs not only to obtain a feel for the “upstream” work often proceeding submission of a TRACS proposal, but also to see if an application to one of these programs would be more suitable than TRACS for the work proposed.
*SARP: <http://www.climate.noaa.gov/cpo_pa/sarp/>
*RISA: <http://www.climate.noaa.gov/cpo_pa/risa/>
- Because proposals seeking to transition national scale tools tend to have wider benefit to the Nation, local or regional scale projects should be clear and rigorous about justifying their value to operational and end-user partners, in demonstrating the already established durability of their partnerships, and in emphasizing their transferability to other regions or scalability to the national level.
- Be sure to focus on establishing in the proposal clear methodology for evaluation of societal benefits, including any benefits evaluation from previous work accomplished in this area, for example, represented in published studies, presentations, articles, or grey literature.
- Generate an organizational chart of Unit partnerships and a clear timeline for transitions with milestones, and include all parties in proposal preparation if at all possible.
- If resubmitting a proposal to TRACS, document in the proposal what changes were made from one year to the next.

TRACS Management

Mr. Josh Foster from the NOAA Climate Office is the Program Coordinator for TRACS (301-427-2370; josh.foster@noaa.gov). He is responsible for developing program announcements, managing resources, and directing the peer review process. TRACS is supported by Ms. Bree Thompson (301-427- 2347; Bree.Thompson@noaa.gov). Both are located at 1100 Wayne Avenue, Suite 1225, Silver Spring, MD 20910.

Each Unit with a funded proposal will be required to provide semi-annual updates demonstrating that project milestones are being met. At the end of the project, in addition to a final project report, evidence must be provided to the program manager of at least experimental success of a product or service in operational mode.

Figure 1: NCTP Unit Model

